

Genes: The Building Blocks of Life

An Internet WebQuest on Genes



[The Quest](#)

[The Process](#)

[Activity](#)

[Evaluation](#)

[Forensics](#)

[Genetic Testing](#)

[Cloning](#)

[Genetically Engineered Food](#)

Introduction

Have you ever wondered how they make those oversized pumpkins so large? Is it possible to completely free yourself from inheriting a fatal heart disease? Could you make an identical copy of yourself? How do police officers track down criminals using blood samples? All of these questions can be answered with knowledge of genetics. Genetics is a topic that has stirred up much controversy and debate in the past decade. The strength, logic, and use of genetics research are constantly under review. Now is your chance to evaluate these topics and use your knowledge!

The Quest

Genetics is a topic that applies to numerous phases of life.

The following four issues are currently under debate:

- The use of forensics in criminal cases
- The recent success of cloning
- Genetically engineered food
- Genetically testing for diseases

You have been chosen for a committee that allocates funding for different types of genetic research. With respect to the four given

aspects of genetics, should funding for each of the research topics be continued? Why or why not?

The Process

Forensics:

1. What is 'Forensics?'
2. What are some advantages and disadvantages of using genetic forensic evidence in criminal court cases?
3. Is using DNA in forensics a well researched form of identification? If not what future research is required?
4. Pro/Con List

DNA Fingerprinting in Human Health and Society

http://www.accessexcellence.org/AB/BA/DNA_Fingerprinting_Basics.html

An Interview with DNA Forensics Authority Dr. Bruce Weir

http://www.accessexcellence.org/AB/BA/Interview_Weir.html

Use of DNA in Identification

http://www.accessexcellence.org/AB/BA/Use_of_DNA_Identification.html

Forensic Technique

http://www.trutv.com/shows/forensic_files/techniques/index.html

How Crime Scene Investigation Works

<http://science.howstuffworks.com/csi.htm>

Crime Scene Response

<http://www.crime-scene-investigator.net/csi-response.html>

Evidence Collection Guidelines

<http://www.crime-scene-investigator.net/collect.html>

Crime Scene Search Technique

<http://www.fbi.gov/hq/lab/handbook/intro16.htm>

Forensic DNA

<http://www.dna.gov/basics/>

Crime Scene Investigation: A Guide for Law Enforcement

<http://www.ncjrs.gov/pdffiles1/nij/178280.pdf>

Forensics Glossary

http://www.trutv.com/shows/forensic_files/glossary.html

Genetic testing for unborn children:

1. What is genetic testing?
2. Is genetic testing of prenatal babies harmful to the health of the babies and/or the mothers?
3. How do genes determine the characteristics you get from your mom and dad?
4. How reliable is genetic testing in predicting diseases?
5. Pro/Con List

Genetic Science Learning Center: Tour of the Basics (Click on What is Inheritance?)

<http://gslc.genetics.utah.edu/units/basics/tour/>

Understanding Gene Testing (Click the Next Button and read through the section entitled What are Today's Options?)

<http://www.accessexcellence.org/AE/AEPC/NIH/gene09.html>

Carlos and Molly Can Have a Perfectly Healthy Baby (or can they?)

http://ehrweb.aaas.org/ehr/books/4_carlos.html

Human Genome Project: Genetic Disease

http://www.ornl.gov/sci/techresources/Human_Genome/medicine/assst.shtml

US Department of Health and Human Services

<http://www.hhs.gov/>

Genetic Disorder Library

<http://learn.genetics.utah.edu/content/disorders/whataregd/>

Genetics Home Reference

<http://ghr.nlm.nih.gov/>

Tyler Medical Clinic

<http://www.tylermedicalclinic.com/diseases.html>

Medicine Net

http://www.medicinenet.com/genetic_disease/article.htm

Cloning:

1. How does cloning work?
2. Is cloning humans realistically possible in the next ten years? If so, should research be continued?
3. Is it ethical to clone humans?
4. Since cloning is such a new phenomenon, what are the possible problems of research in this area?
5. Pro/Con List

WhyFiles? - Cloning Animals (Read all 11 pages)

<http://whyfiles.org/034clone/index.html>

ThinkQuest Entry: Conceiving a Clone (Read all 4 links under Reactions)

<http://library.advanced.org/24355/>

Essay on Cloning

<http://www.nimr.mrc.ac.uk/MillHillEssays/1997/cloning.htm>

Cloning: Ethical Concerns

<http://www2.worldbook.com/features/cloning/html/ethics.html>

Human Genome Project: Cloning

http://www.ornl.gov/sci/techresources/Human_Genome/elsi/cloning.shtml

Genetic Science Learning Center: Cloning
<http://learn.genetics.utah.edu/content/tech/cloning/>

National Human Genome Research Institute
<http://www.genome.gov/25020028>

US National Library of Medicine
<http://learn.genetics.utah.edu/content/tech/cloning/>

How Cloning Works
<http://www.howstuffworks.com/cloning.htm>

The History of Cloning
<http://www.msnbc.com/news/wld/health/brill/cloningtimeline.htm>

American Medical Association
<http://www.ama-assn.org/ama/pub/category/4560.html>

Genetically engineering crops:

1. What does it mean to genetically engineer a crop? How does the process work?
2. How are genetically altered crops beneficial to society?
3. Are there any harmful effects of genetically altered crops?
4. Pro/Con List

Why Files? - Field of Genes (Read all 6 pages)
http://whyfiles.org/062ag_gene_eng/index.html

Designer Seeds (Read articles 1 through 4)
<http://www.beyonddiscovery.org/content/view/article.asp?a=167>

The Alliance for Better Foods: The Promise of Biotechnology
<http://www.betterfoods.org/Promise/Promise.htm>

The Safety of Genetically Engineered Foods
<http://www.psrast.org/defknfood.htm>

US Food and Drug Administration
http://www.fda.gov/fdac/features/2003/603_food.html

Global Issues

<http://www.globalissues.org/issue/188/genetically-engineered-food>

ProQuest

<http://www.csa.com/discoveryguides/gmfood/overview.php>

Center for Food Safety

<http://www.centerforfoodsafety.org/geneticall2.cfm>

Human Genome Project: Engineered Food

http://www.ornl.gov/sci/techresources/Human_Genome/elsi/gmfood.shtml

American Institute of Biological Sciences: The Debate

<http://www.actionbioscience.org/biotech/sakko.html>

Activity

You have all learned about a different part of genetics. Now in your group, discuss each of your aspects. Weigh the pros and cons of each part. Work together to come to an agreement about rather or not genetic research should be continued in the four topics. Due to the fact that each of you researched a different area of genetics, your viewpoints may be dissimilar. Use the knowledge you acquired from your research to convince your teammates that your viewpoint is important and should be part of your team's answer. Your team should write out an answer that everyone on the team can live with.

Real World Simulation

Now that your team has come to an agreement, you can develop a persuasive argument. Use PowerPoint to create an oral and visual presentation stating your decisions; which areas of genetic study are you going to continue to fund and which ones are you going to stop funding? Your presentation should be focused on convincing the rest of the class to agree with your decision.

Slide 1: Introduction

Slide 2: Forensics /Briefly explain the process
Slide 3: Pros
Slide 4: Cons
Slide 5: Your decision about Forensics /Should it be funded?
Slide 6: Genetic testing/Briefly explain the process
Slide 7: Pros
Slide 8: Cons
Slide 9: Your decision about Genetic testing /Should it be funded?
Slide 6: Cloning /Briefly explain the process
Slide 7: Pros
Slide 8: Cons
Slide 9: Your decision about cloning /Should it be funded?
Slide 6: Genetically engineering crops/Briefly explain the process
Slide 7: Pros
Slide 8: Cons
Slide 9: Your decision about Genetically engineering crops /Should it be funded?

Evaluation

The purpose of this WebQuest is for you to gain a concrete knowledge of the following aspects of genetics: genetic testing, genetically engineered food, forensics and DNA, and cloning. The main goal of the research is to answer the following question: "Should these elements of genetic research be funded?" You should also come away from this lesson with efficient group work skills, an understanding of PowerPoint, consensus building techniques, and the ability to create a persuasive argument.

The main product of all of your research and teamwork is the PowerPoint presentation. The presentation will be judged based primarily on the content of the presentation, and not solely on the quality of the PowerPoint presentation (since the details of PowerPoint were not focused on in this lesson). All four aspects of genetics should be addressed along with if you believe it should continued to be funded, based on your group's agreement. Your presentation should have solid, specific supporting research for why your group arrived at

your decision, including advantages, disadvantages, and explicit examples. [Click here](#) to see the evaluation rubric.